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TECHNICAL MEMORANDUM

(TM Series)

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Utility Program Descriptions
Milestone 11
Symbolic Dump Routine (SYMDUMP)

By

F. J. LaChapelle
R. L. Kinhead

14 March 1963

Approved

J. B. Munson

SYSTEM

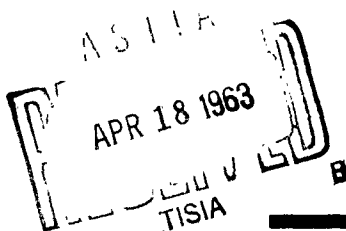
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SUBROUTINE IDENTIFICATION

- A. Title: Symbolic Dump Routine (SYMDUMP) - Ident A48, Mod AB
- B. Programmed and Documented: 14 July 1962
F. J. LaChapelle, System Development Corporation
- C. Revised: 14 February 1963, documented: 14 March 1963
R. L. Kinkead, System Development Corporation

PURPOSE

To provide octal, symbolic, floating point decimal, or BCD dumps of COPII routines using their names to define the areas in core to be dumped.

USAGE

- A. Calling Sequence

L	RTJ	SYMDUMP
L+1	Normal	Return
	ZRO	N
L+2	BCD	1XXXXXXXX
L+3	DEC	T
L+4	BCD	1PROG1
L+5	BCD	1PROG2
.	.	.
.	.	.
.	.	.
L+K	BCD	1PROG(LAST)

Where:

N = the total number of parameters

T = the logical tape or printer to write dump on ($2 \leq T \leq 13$).

PROG1 ... PROG(LAST) = the names of the specific routines to dump
(left adjusted with trailing blanks).

- B. The Parameter XXXXXXXX is optional and if it is present, the result will be that the routines will be dumped in the specified format. The possible values of XXXXXXXX are:

1. SYMBOLIC - mnemonic format
2. FLOATDEC - floating point decimal format, and
3. BCD - BCD format.

If absent, the dump will be in octal.

- C. When called by a function card:

* SYMDUMP XXXXXXXX T PROG1 ... PROG(LAST)

where all parameters are defined as above with XXXXXXXX again optional.

RESTRICTIONS

- A. SYMDUMP uses the TTTT table, LCOUNT, LINFO, and INAMES.
- B. SYMDUMP uses the subroutine CORE, (TM-(L)-715/016/001A).
- C. A page eject follows the dump of each program and no end of file is written following a dump.
- D. A maximum of twenty routines may be dumped with one call to SYMDUMP.
- E. Only those routines defined previously by a DEFINES card or those routines which have been loaded by MTCII at execution time may be dumped by SYMDUMP.
- F. It is possible to call six selected areas of core by six special names. These areas and their mnemonics are: COMMON (06743₈ - 07106₈), POOL (04700₈ - 07106₈), COP (00000₈ - 07777₈ and 70000₈ - 77777₈), ZEROTEN (00000₈ - 00010₈), INOUT (00000₈ - 07777₈), and ALLCOP (00000₈ - 07777₈ and 70000₈ - 77777₈). Note that COP and ALLCOP are

the same areas and consist of two separate parts. INOUT is everything below 10000₈ since the I/O routines and buffers are scattered throughout this area.

- G. If a routine is requested which is not a special name or has not been loaded or defined, a one-line record to this effect is written on the output tape. The normal dumping of the remaining routines then resumes.
- H. If an absolute program is requested, a dump beginning with the first cell of the program and extending through 76432₈ is made.
- I. If the logical tape is illegal, a normal return is made with no error message.
- J. Output is called into core by CORE using the ADDR0F feature in MTCII if FLOATDEC or BCD formats are selected.

TIMING

SYMDUMP takes a maximum of one minute to dump "32K" core.

STORAGE

- 233₈ cells total.
- 121₈ cells are instruction cells.
- 15₈ cells for a table defining the special areas of core.
- 25₈ cells contain messages.
- 15₈ cells are constants.
- 33₈ cells are temporary storage.

VALIDATION TESTS

SYMDUMP was tested by the use of function cards. It was tested for dumping defined routines, routines called from the master tape, and the special areas of core (in all of the possible formats). Tests were made which printed on tape and the on-line printer. Multiple dumps were tested, as

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was SYMDUMP's response to illegal tape numbers and to subroutines not in core.

See Appendix A for the function card inputs and the dump results of these tests.

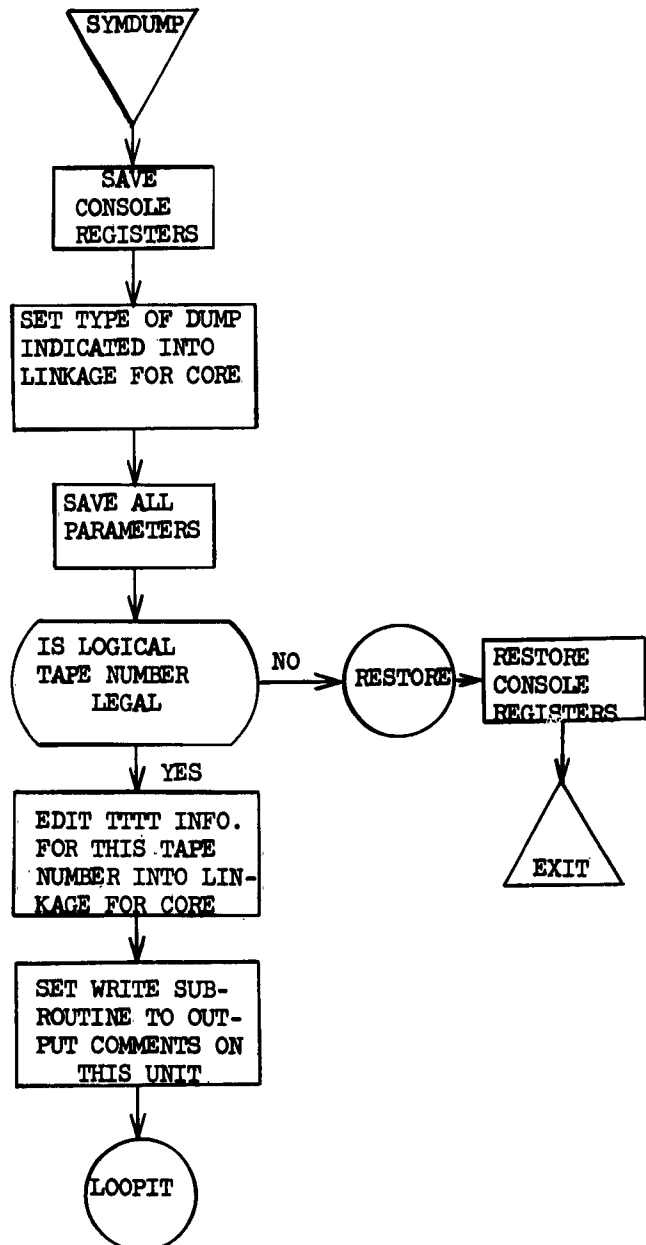
REFERENCES

- A. "1604 Systems Manual", Lockheed Missiles and Space Division
LMSC - 44758, 1 January 1962, P. 50.12.01.
- B. Computer Program Library Catalog No. 75048.

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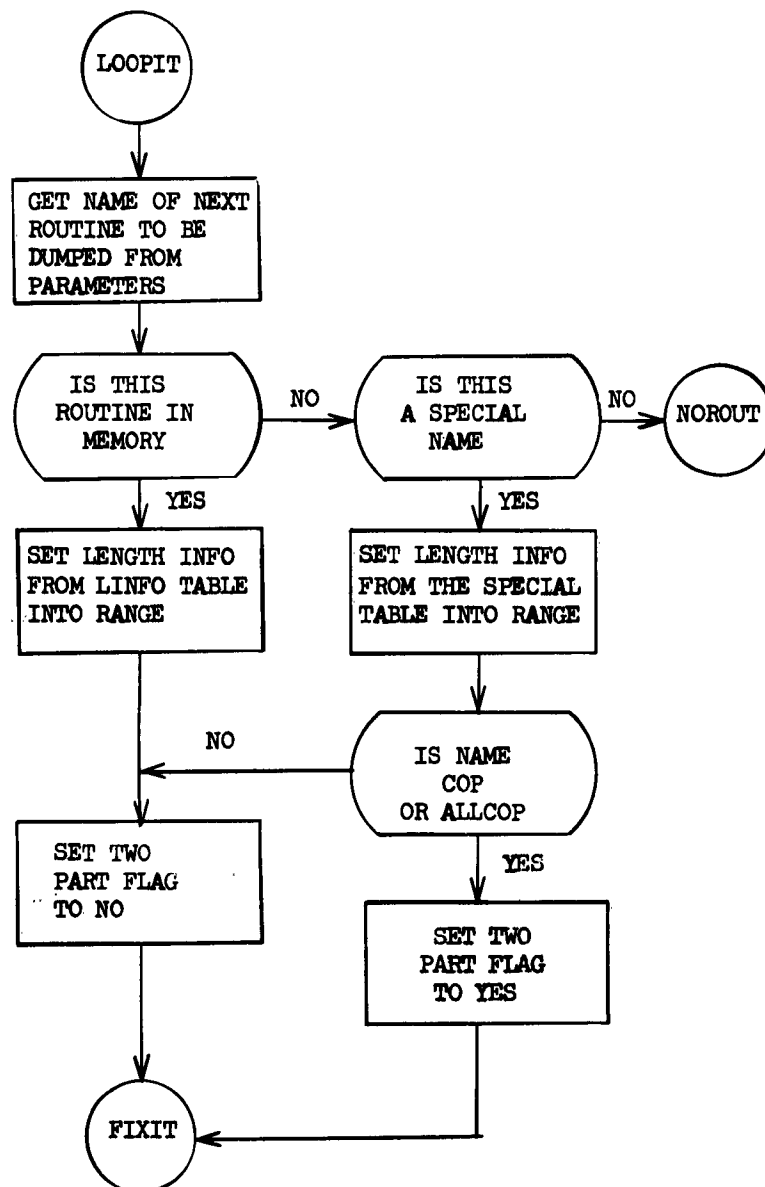
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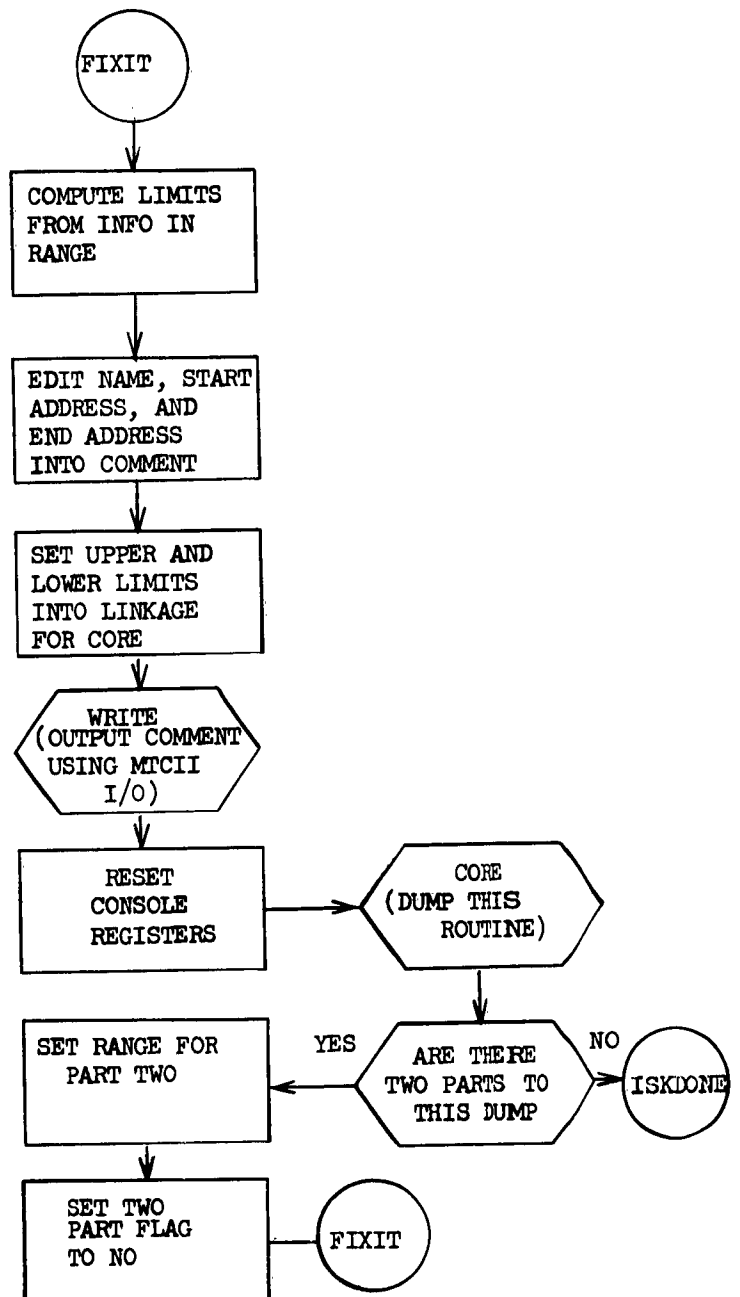
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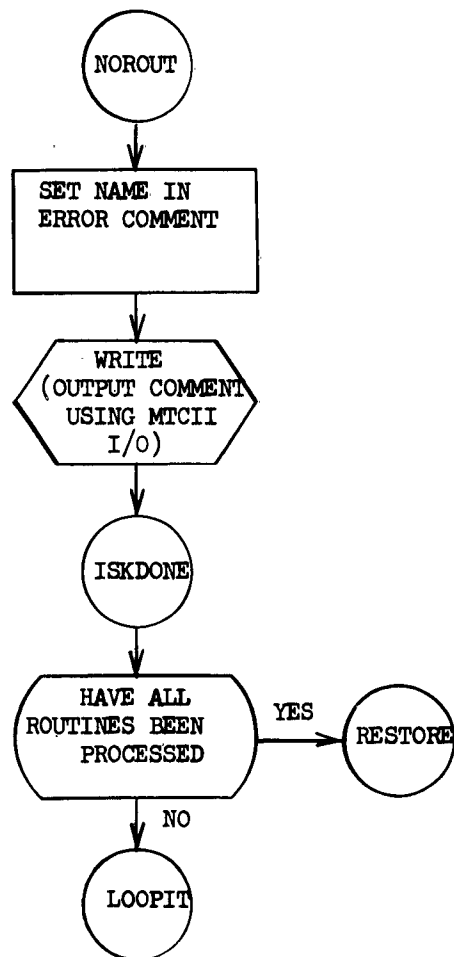
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APPENDIX A

SS:IM 1A MASTER
UTILITY MASTER JUN17 MON 15 13 MAR 63

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*CLR
*CARDS
DEFINES ALPHA 100
* 4 SYNDU:P 13 SIN ALPHA USUCH EXP

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STORAGE ANALYSIS

(* = RELOCATABLE N = NEWLY DEFINED R = REDEFINITION)

NAME	ADDRESS	NAME	ADDRESS	NAME	ADDRESS
CURE	* 10251	SYNDUMP	* 11272	UNPACK	* 11242
FLOATIN	* 11254	EXP	* 10164	SIN	* 10100
ALPHA	* 10000				

*SYNDJMP SYMBOLIC 4 SIN ZERO TEN
 *SYNDJMP FLOATDEC 13 EXP
 *SYNDJMP BCD 4 ALPHA NOSUBM

DUMP OF THE SIN	ROUTINE.	RANGE IS FROM			Q-REGISTER					
		ACCUMULATOR	I-1	I-2	I-3	I-4	I-5	I-6		
516586474646320	0000000000000000	00000	00251	76432	00771	00000	00000			
10100	75 0 77777	56 1 10133	42 0 10136	20 0 10153	22 2 10103	42 0 10136	52 1 10100	57 1 10133		
10104	45 0 10137	75 6 10107	51 1 00001	57 1 10133	65 0 10140	75 0 10110	13 0 10153	75 0 10133		
10110	04 0 77775	21 0 10154	75 4 11242	50 0 00000	50 1 00003	22 2 10134	42 0 10136	61 0 10114		
10114	10 0 00000	03 0 77777	27 0 10142	42 0 10136	36 0 10153	14 0 10154	40 0 10143	11 0 10125		
10120	61 0 10121	44 0 10136	22 0 10133	75 0 77777	15 0 10142	75 0 10125	42 0 10136	75 0 10125		
10124	15 0 10142	42 0 10136	20 0 10153	26 0 10153	20 0 10152	26 0 10144	14 1 10146	26 0 10152		
10130	55 1 10127	14 0 10145	26 0 10153	03 0 00044	75 4 11254	50 0 00000	50 1 77777	75 0 77777		
10134	60 0 10135	10 0 00000	07 0 77777	75 0 10115	77 7 77777	77 7 77777	20 5 77777	77 7 77777		
10140	17 3 24000	00 0 00000	20 0 14000	00 0 00000	31 1 03755	24 2 10242	77 7 77777	77 7 77774		
10144	77 7 77777	63 1 36752	00 0 17777	77 7 77775	77 7 65252	52 5 25746	00 0 02104	21 0 26751		
10150	77 7 77627	76 4 12550	00 0 00005	61 3 27443	00 0 00000	00 0 00000	00 0 00000	00 0 00000		
10154	*****	*****	00 0 00000	00 0 00000	*****					
10164	75 0 77777	50 1 10225	65 0 10230	75 0 10164	52 1 10164	51 1 00001	65 0 10231	75 0 10172		

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DUMP OF THE ALPHA ACCUMULATOR	ROUTINE.	RANGE IS FROM O-REGISTER	10000 TO 10100					
			1-1	1-2	1-3	1-4	1-5	1-6
5165664746464320		0000000000000000	00000	00251	76432	00771	00000	00000
10060	51 6 25364	65 6 66770	44 4 54647	50 5 12223	24 2 52427	30 3 11201	02 0 30405	
10004	06 0 71011	14 3 45474	40 2 16020	20 2 06162	63 6 46566	67 7 06162	63 6 46566	
10010	*****	61 6 26364	65 6 66770	*****				
10020	50 0 10100	50 0 10164	00 0 00000	00 0 00000	00 0 00000	00 0 00000	00 0 00000	
10024	*****	00 0 00000	00 0 00000	*****				
10074	00 0 00000	00 0 00000	00 0 00000	00 0 00000	00 0 00000	00 0 00000	00 0 00000	
10100	75 0 77777	56 1 10133	42 0 10136	22 2 10103	42 0 10136	52 1 10100	57 1 10133	

THE ROUTINE NOSUCH IS NOT IN CORE. CHECK YOUR FUNCTION CALLS FOR AN ERROR.

DUMP OF THE EYP ACCUMULATOR	ROUTINE.	RANGE IS FROM O-REGISTER	10164 TO 10251					
			1-1	1-2	1-3	1-4	1-5	1-6
5165664746464320		0000000000000000	00000	00251	76432	00771	00000	00000
10164	75 0 77777	56 1 10225	75 0 10164	52 1 10164	51 1 00001	65 0 10231	75 0 10172	
10170	57 1 10171	52 1 10225	75 0 77777	75 4 11242	50 0 00000	22 2 10177	42 0 10232	
10174	60 0 10176	10 0 00000	23 2 10176	02 0 77777	75 0 10202	60 0 10201	10 0 00000	
10200	23 2 10201	10 0 77777	07 0 77777	27 0 10233	20 0 10245	44 0 10232	01 0 00002	
10204	20 0 10246	20 0 10247	14 0 10234	20 0 10244	12 0 10235	27 0 10244	14 0 10236	
10210	26 0 10247	07 0 00604	14 0 10237	20 0 10246	12 0 10246	27 0 10244	14 0 10240	
10214	57 1 10225	34 1 00857	20 0 10247	03 0 00001	22 2 10226	23 3 10227	11 0 77776	
10220	11 1 77721	50 1 00000	16 0 10247	03 0 00014	44 0 10232	41 0 10241	42 0 10240	
10224	55 1 10225	32 0 10242	50 1 77777	23 2 10227	75 0 10220	11 1 77721	75 0 10221	
10230	20 1 25424	26 0 02400	57 6 52353	77 7 77777	77 7 77777	05 4 27102	77 5 75066	
10234	25 0 03355	62 1 15462	01 1 63465	00 6 31225	67 4 33611	10 0 00000	00 0 00141	
10240	20 0 00000	00 0 00000	40 0 00000	20 0 15520	23 6 31477	00 0 00000	00 0 00000	
10244	00 0 00000	00 0 00000	00 0 00000	00 0 00000	00 0 00000	00 0 00000	00 0 00000	
10250	00 0 00000	00 0 00000	75 0 11372	75 0 10255	20 0 11164	75 4 10653	10 0 77776	20 0 11012

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DUMP OF THE SIN ROUTINE, RANGE IS FROM 10100 TO 10164
ACCUMULATOR 0-REGISTER I-1 I-2 I-3 I-4 I-5 I-6
5165664746464320 0000000000000000 00000 00251 76432 00771 00000
10100 SLJ 77777 SIU 1 10133 SCH 10136 STA 10153 AJP P 10103 SCH 10136 LIU 1 10100 SIL 1 10133
10104 TMS 10137 SLJ 10107 INT 1 00001 SIL 1 10133 TMS 10140 SLJ 10110 LAC 10153 SLJ 10133
10110 EVO 77775 STO 10154 RTJ 11242 NOP 00000 ENI 1 00003 AJP P 10134 SCH 10136 SAL 10114
10114 ENA 00000 LRS 77777 DVF 10142 SCH 10136 SSK 10153 ADD 10154 SST 10143 INA 10125
10120 SAL 10121 LDL 10136 AJP 2 10133 SLJ 77777 SUB 10142 SLJ 10125 SCH 10136 SLJ 10125
10124 SUB 10142 SCH 10136 STA 10153 MUF 10153 STA 10152 MUF 10144 ADD 1 10146 MUF 10152
10130 LJP 1 10127 ADD 10145 MUF 10153 LRS 00044 RTJ 11254 NOP 00000 ENI 1 77777 SLJ 77777
10134 SAU 10135 ENA 00000 LLS 77777 SLJ 10115 SEV 7 77777 SEV 7 77777 STA 5 77777 SEV 7 77777
10140 LOC 3 24000 ZRO 00000 STA 14000 ZRO 00000 FSB 1 03755 HUI 2 10242 SEV 7 77777 SEV 7 77774
10144 SEV 7 77777 OUT 1 36752 ZRO 17777 SEV 7 77775 SEV 7 65252 LIU 5 25746 ZRO 02104 STO 26751
10150 SEV 7 77627 SRJ 12550 ZRO 00005 SAL 3 27443 ZRO 00000 ZRO 00000 ZRO 00000 ZRO 00000
10154 ***** ZRO 00000 ZRO 00000 *****
10164 SLJ 77777 SIU 1 10225 TMS 10230 SLJ 10164 LIU 1 10164 INT 1 00001 TMS 10231 SLJ 10172

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DUMP OF THE ZEROTEN ROUTINE, RANGE IS FROM 00000 TO 00011
ACCUMULATOR 0-REGISTER I-1 I-2 I-3 I-4 I-5 I-6
5165664746464320 0000000000000000 00000 00251 76432 00771 00000
00000 SEL 32005 SEN 32000 SEN 00004 ZRO 01004 ENI 3 01325 SLJ 01325 ZRO 02356 ZRO 02356
00004 LLS 11224 OLS 11242 LLS 00014 SAU 00006 ACT 3 00250 SLJ 00034 SLJ 04141 SLJ 04142
00010 ENI 3 00003 SIL 00003 ACT 3 00000 SLJ 00044 ACT 3 00002 SEN 32000 ENI 1 07717 ENO 00000

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DUMP OF THE EXP	ROUTINE	RANGE IS FROM	10164	TO	10251	1-6
ACCUMULATOR	O-REGISTER	1-1	1-2	1-3	1-4	1-5
5165647464320	00000000000000	00000	00251	76432	00771	00000
10164	750777756110225	-225342629 -96		-373827614+113		-225265479 -96
10170	-174793390 +17	100000075077777		-339542765-260		2221017742010232
10174	-484603882 +0	232101761007777		484572660-267		-484237671 +0
10200	232102011007777	103495994-170		2701023320010245		-373535262+231
10204	2001024625010246	2001024714010234		2001024412010235		2701024414010236
10210	200102470700004	1401023715010246		2001024412010246		2701024414010240
10214	-173571568 +17	2001024712010245		0300000122210226		233102271107776
10220	.591449906-130	150102470600001		0300001444010232		-234024847+289
10224	-590630373 +55	501777775077777		2321022775010220		.891521762-130
10230	.709085957 +3	-709085957 +3		-0		.363901890-201
10234	2500335562115462	0116346511622313		0063122567433611		1000000000000141
10240	200000000000000	-898846567+308		.141421356 +1		0
10244	0	0		0		0
10250	0	-142067603-250		2001116475410653		.190851960-151

DUMP OF THE ALPHA	ROUTINE	RANGE IS FROM	10000	TO	10100	1-6
ACCUMULATOR	O-REGISTER	1-1	1-2	1-3	1-4	1-5
5165647464320	00000000000000	00000	00251	76432	00771	00000
10000	ABCDEFH	IJKLMNOP	QRSTUVWX	YZ012345		
10004	67890123	45678901	23456789	01234567		
10010	*****	*****	*****	*****		
10020	0110					
10024	*****					
10074						
10100	2711091	K11E 11E	S/13K11E	>91		

THE ROUTINE NOSUCH IS NOT IN CORE. CHECK YOUR FUNCTION CARD FOR AN ERROR.

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UNCLASSIFIED

System Development Corporation,
Santa Monica, California
UTILITY PROGRAM DESCRIPTIONS
MILESTONE 11 SYMBOLIC DUMP ROUTINE
(SYMDUMP)
Scientific rept., TM(L)-715/019/01,
by F. J. LaChapelle, R. L. Kinkead.
14 March 1963, 12p., 2 refs.
(Contract AF 19(628)-1648, Space
Systems Division Program, for Space
Systems Division, AFSC)

Unclassified report

DESCRIPTORS: Programming (Computers).
Satellite Networks.

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States that the Symbolic Dump
Routine (SYMDUMP) provides octal,
symbolic, floating point decimal,
or BCD dumps of COPII (Control for
Operational Programs) routines using
their names to define the areas in
core to be dumped.

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